

## CLAIMS:

1. A method of recording data in the form of bits (43) in tracks on a magnetic medium (69), the recorded tracks having a trackwidth (44) and the recorded bits in the track having a bitlength (45), using thermally assisted recording to record data at an elevated temperature on the medium using a magnetic write head (76) for generating a magnetic field and an optical head (71-75) for the local heating of the medium by light from the optical head during recording for the temporary reduction of the coercivity of the medium to facilitate recording, characterized in that the said trackwidth is defined by the profile of the magnetic field and the said bitlength is defined by the thermal profile induced in the magnetic medium by the laser light.

2. A method according to claim 1, characterized in that the light is pulsed.

3. A method according to claim 1, characterized in that the magnetic field during

4. A method according to claim 1, characterized in that reading of the data is performed by detecting the magnetic stray-field variations of the medium using a magneto-resistive (MR) sensor.

5. A method according to claim 1 or 2, characterized in that reading of the data is performed using the magneto-optical (MO) effect of the medium by means of an optical sensor.

6. A recording apparatus for recording data in the form of bits along at least one track on a magnetic recording medium (69), the track having a track direction, the apparatus including a magnetic write head (76) for generating a magnetic field having a profile at a recording location, an optical head (71-75) for forming a light spot at the recording location for inducing a thermal profile in the medium, and an actuator (192) for moving the recording location relative to the medium in the track direction, characterized in that the profile of the

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magnetic field defines the width of a recorded bit in a direction perpendicular to the track direction and the thermal profile defines a length of a recorded bit in the track direction.

7. A recording apparatus according to claim 6, characterized in that the magnetic write head (76) and the optical head (71-75) are arranged on the same side of the magnetic medium (69).

8. A recording apparatus according to claim 6, characterized in that the magnetic recording medium is a magnetic disc medium (69) and in that the apparatus includes an integrated flying slider (67) having a medium-facing surface (82, 83) disposed on a first side of the slider, the said slider including at least one magnetic head provided with a first pole (78, 88) defining a width of the track, the first pole facing the medium-facing side of the slider, the slider also having an optical head including an exit window (73') in the medium-facing surface and arranged to project a light beam out of the exit window to form a light spot on the magnetic recording medium, the exit window neighbouring the pole in the track direction.

9. A recording apparatus according to claim 8, characterized in that the magnetic head includes at least one return pole (122), the return pole and the first pole (121) being oriented in a direction perpendicular to the track direction.

10. A recording apparatus according to claim 6, characterized in that it includes a thin film magneto-resistive read head (117) of the shielded type.

11. A recording apparatus according to claim 6, characterized in that the optical head comprise focussing means (113, 114) for focussing a light beam to the light spot on the magnetic recording medium.

12. A recording apparatus according to claim 6, characterized in that the optical head comprises adjusting means (74) arranged for adjusting the position of the light spot relative to the pole of the magnetic recording head.

13. A recording apparatus according to claim 12, characterized in that the adjusting means comprise a mirror (74) and mirror support means, the mirror being at least temporarily movable relative to the mirror support means for adjusting purposes.

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14. A slider (67) for a recording apparatus as defined claim 6.

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